

ORAL PRESENTATION

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Aggregation in cattle dung-colonizing insect communities

Richard Wall*, Colin Lee

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Background

Ruminant dung is a highly ephemeral, patchily distributed resource, which is utilized by a diverse community of invertebrate species. This ecologically important community may be affected adversely by insecticide and endectocide residues in the faeces of treated cattle. The aim of the present work was to quantify the aggregation of the insects colonising cow-dung in cattle pastures and test the hypothesis that the dung-pat community assemblage observed is the result of stochastic colonization events.

Methods

Fresh dung from dairy cattle was used to construct arrays of standardised, 1.5kg, artificial cow pats in cattle pastures. Batches of ten pats were placed out each week for 24 weeks, between May and October in 2001. Pats were left exposed in the field for seven days, to allow colonisation. Pats were then brought back to the laboratory and insect colonizers were collected and identified.

Results

Individual pats contained on average, only half the number of insect taxa present in an entire batch put out at any one time. Among six representative taxa of Diptera and four of Coleoptera, significant levels of intraspecific aggregation were observed in all but one (*Mesembina meridiana*), with the abundance of most taxa within pats approximating a negative binomial distribution. A simulation analysis was used to show that the observed relative frequency of taxa within pats does not differ from that expected by chance if colonisation is a

random binomial event in which each species colonises a pat independently of all other species.

Conclusion

The highly aggregated distributions observed in this study highlight the need for relatively large sample sizes when attempting to assess the abundance and distribution of individual taxa in cow dung. In addition, the results suggest that the aggregated populations of even highly abundant insects will be more susceptible to the deleterious effects of insecticidal residues in dung than if they were evenly distributed, if by chance they colonize a pat containing insecticidal residues from a recently treated animal.

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Veterinary Parasitology & Ecology Group, School of Biological Sciences, University of Bristol, Woodland Road, Bristol, BS8 1UG, UK